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CATINELLA VAGANS (PILSBRY) AND A NEW SPECIES OF *CATINELLA* (SUCCINEIDAE PULMONATA) FROM THE SHORE OF LAKE WACCAMAW, NORTH CAROLINA

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ABSTRACT

Pilsbry (1948), on the bases of differences of shell features as well as of the reproductive systems, recognized two "varieties" of Catinella (Quickella) vagans. *The type locality of* C. vagans *is Cape May Point, New Jersey; locality of the second "variety" is Lake Waccamaw, North Carolina. The observations of Pilsbry* (ibid), *as well as my own, are sufficient reasons for recognizing these two populations as distinct species of* Catinella.

In 1900 Pilsbry described *Succinea campestris vagans* from Cape May Point, New Jersey; this species is now known as *Catinella vagans* (Pilsbry). Later Pilsbry mentioned and figured (1948, p. 844, Fig. 456C) a specimen from the shores of Lake Waccamaw, North Carolina, which varied in certain details from the type series. The observations of Pilsbry (1948:843–845) as well as my own are sufficient reasons for recognizing these two populations as distinct species.

Shell characteristics, patterns of pigmentation of body and mantle, structural details of radulae and jaws, and the anatomy of reproductive systems are criteria for identification of genera and species of Succineidae. Geographic distribution, geographic barriers, microhabitats, adaptation to environmental conditions, time of maturing and mating seasons also are significant factors to be considered in the recognition of species, especially in the family Succineidae.

Catinella vagans (Pilsbry)

Succinea campestris vagans Pilsbry, 1900. *The Nautilus*, 14(7):74.

Quickella vagans (Pilsbry) 1948. *Land Mollusca of North America*, vol. 2, Pt. 2:843–845; Figs. 443d, 456A, B, C.

Because of beach erosion, the type locality on Cape May Point, New Jersey, as known at the time Pilsbry described *Succinea campestris vagans* no longer exists. On June 7, 1979, I obtained a number of *Catinella vagans* from two localities in the vicinity of what is now known as Cape May Point, New Jersey, namely: (1) D. S. Franzen Field No. 494, shore of pond, city of Wildwood pumping station, on New Jersey Highway 47, northwest of Rio Grande, Cape May County, New Jersey. A colony of *C. vagans* was living under fine litter on the wet, flat shore of the pond. Some *C. vagans* were crawling on grass blades. The edge of the pond supported growths of predominately willow *(Salix)* and poison ivy *(Rhus)*. (2) D. S. Franzen Field No. 495, Cape May County Park located between U.S. Highway 9 and the Garden State Parkway Lake Shore Road, city of Cape May Court House, Cape May County, New Jersey. Several *C. vagans* were on the wet, sandy loam soil of a small bay of the shore of the freshwater lake. Trees growing along the shore included willow *(Salix)*, sweet gum *(Liquidamber)*, maple *(Acer)* and oak *(Quercus)*. A third locality: D. S. Franzen Field No. 499, June 13, 1979. Burton's Pond located on south edge of Angola, Route Delaware 24E, Sussex County, Delaware. Only two *C. vagans* were found living on twig litter on the wet bank of the pond. The small number might be attributed to the last spring's flooding of the flood plain. The bank supported growths of willow *(Salix)* and bulrush *(Scirpus)*. *Typha* and *Saggitaria* grew at the edge and in shallow water of the pond.

The following is a description of *Catinella vagans* as now known from the vicinity of Cape May Point, New Jersey:

Shell–(Fig. 1A, B) Shell globose-ovate, amber-colored, translucent, fragile, imperforate, composed of 2–1/4 to 3 inflated, sharply incised whorls; height 7.6 mm to 10.8 mm; width 5.0 mm to 6.4 mm (Table 1); nuclear whorl appressed, spire short; whorls increase rapidly resulting in a tumid ultimate whorl. Ovate aperture occupies seven tenths to eight tenths of height of shell (Table 1). Surface of nuclear whorl finely granular, sometimes mottled whitish because of worn periostracum; striations fine on penultimate whorl, gradually becoming moderately coarse towards the aperture; sharply edged peristome fragile; callus on ultimate whorl may not be visible. Amber-colored columella follows inner border of peristome curving as it ascends into the ultimate whorl.

Head, Body and Mantle Surfaces–"The cream-white body and head are sparsely peppered with minute dots" (Pilsbry, 1948, p. 845). The series of *Catinella vagans* from the three

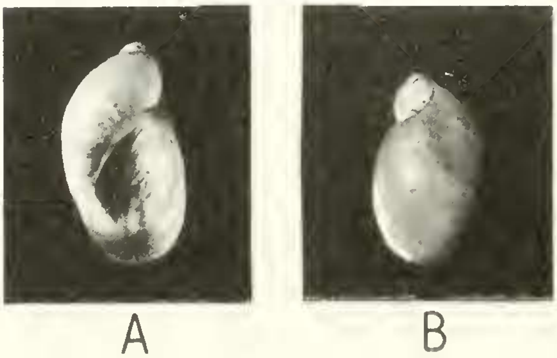

FIG. 1. **A**, Catinella vagans *(Pilsbry) (Height 10.5 mm).* **B**, Catinella vagans *(Pilsbry) (Height 9.5 mm). Both shells from D. S. Franzen Field No. 494; Pond, city of Wildwood pumping station, Cape May County, New Jersey.*

	No. of Whorls	Height	Width	Width/ Height	Height of Aperture	Width of Aperture	H. Ap./ H. Shell	W. Ap./ W. Shell	W. Ap./ H. Ap.
Field #494 Pumping Station,	2 3/4	10.8 mm	6.4 mm	592	8.4 mm	5.1 mm	.777	796	.607
City of Wildwood, Cape May County,	3	10.7	6.4	598	8.2	4.8	766	750	.585
New Jersey	3	10.5	6.0	.571	7.8	4.4	.742	733	.564
	2 3/4	9.8	6.0	.612	7.4	4.5	.755	.750	.607
	3	9.8	5.8	.591	7.2	4.6	.734	.793	.638
Range (16 shells)	2 1/4-3	7.6-10.8	5.0-6.4	.567-.663	5.8-8.4	3.8-5.1	.726-797	.730-.851	.564-.677
Median		9.5	5.7	.619	7.2	4.4	.766	.76	.626
Field #495 Cape May County	3	10.6 mm	6.7 mm	.632	8.2 mm	5.0 mm	.773	.746	.609
Park, Cape May Court House, Cape	2 2/3	9.5	6.0	.631	7.0	4.5	.736	.75	.642
May County,	3	9.3	5.7	.612	6.7	4.0	.720	.701	.597
New Jersey	3	9.0	6.0	.666	7.0	4.2	.777	.70	.60
	2 1/4	8.2	4.8	.585	6.6	3.7	.804	.770	.560
Range (8 shells)	2 1/4-3	6.1-10.6	4.1-6.7	.585-.679	5.0-8.2	3.0-5.0	.720-.819	.70-.777	.560-.672
Median		9.0	5.7	.632	6.7	4.1	.777	.75	.609
Field #499 Burton's Pond,	2 3/4	10.1 mm	6.1 mm	603	7.4 mm	4.5 mm	732	.737	.608
Angola, Sussex County, New Jersey	2 1/3	9.1	5.0	.549	6.8	4.0	.747	.80	.588

TABLE 1. *Dimensions of shells of* Catinella vagans *(Pilsbry). The measurements are of the five largest shells of the first two localities and of the two shells obtained from the third locality. In the 4th column of measurements are listed the ratios of the width of the shell over its height. In the last 3 columns are listed the ratios of height of aperture over height of shell, width of aperture over width of shell, width of aperture over height of aperture.*

localities included in this study exhibit variations in pigmentation from those of Pilsbry's description. The following is a description of a representative pigmented *C. vagans* (Field No. D. S. Franzen 494). Surface of head light cream-colored, irregularly tuberculate. Pigmentation of dorsal surface of head consists of a median band flanked on either side by two bands, convergent at anterior end of the head, spreading and then converging at level of base of the superior (posterior) tentacles, spreading again to extend over the remainder of the head region; some bands extend a short distance onto the dorsal, white body surface; on either side of these bands another band extends from the anterior end of the head, over the superior tentacles to continue over the remainder of the head region.

Lateral body wall cream-colored, coarsely and irregularly tuberculate. On either side a broad, pigmented band, consisting of a series of dorsoventral bands, extends from the labial palyp to posterior tip of body. The semi-lunar genital aperture, about 1.0 mm in length, surrounded by a white lip, is situated on right-hand side of body immediately posterior to the head region. On either side a pedal groove, extending from labial palyp to posterior end of body, separates foot from lateral body wall; pedal groove is paralleled by a less pronounced suprapedal groove. Shallow vertical grooves incise suprapedal and pedal grooves and pigmented band, produce scallops along margin of foot especially when animal is in a somewhat contracted state. Sole of foot is cream-colored, unpigmented.

Anterior and posterior inner margin of mantle collar outlined by bands of fine flecks. Free edge of mantle collar, white. Pigmented band along anterior dorsal margin of mantle flecked from left side to mid-dorsal area, becoming solid black on right hand side and terminating as a band of flecks. Across dorsal surface of mantle dark streaks extend from anterior band to area of the cream-colored nephridium where a black band outlines its anterior margin. Posterior to nephridium are scattered patches of pigment. Color of liver is golden brown.

Variations—Color of head varies from almost white to a dark cream. Patterns of pigmentation of head, body and mantle collar are constant, varying only in intensity. Band paralleling mantle collar ranges from very narrow to one which includes a broad, dark blotch. Pigmentation of mantle assumes various patterns: (1) Narrow streaks of pigment extend over the mantle to anterior margin of nephridium; posterior margin of nephridium outlined by an irregular, broad band. (2) Mantle pigment is in form of a network of streaks becoming broader and more blotched over the nephridium. (3) Very narrow band parallels mantle collar from which broad, netted bands extend for one-third the distance from mantle edge to anterior margin of nephridium; several heavy blotches located in intervening space; anterior margin of nephridium partially outlined by a narrow, lightly pigmented band. “The mantle over the lung is translucent whitish with some faint gray spots (seen under magnification to be composed of minute flecks of pigment); several next to the thickened edge being larger and longer . . . The thick mantle edge . . . not dotted” (Pilsbry, 1948, p. 845).

Reproductive System–(Fig. 2) Albumin gland (AG) somewhat larger than prostate gland, triangular in form, composed of fine acini, is enclosed within a thin, transparent, unpigmented sheath. Seminal vesicle (SV) composed of a long lobe and of a shorter, narrower lobe closely adherent to the longer lobe, is enclosed within a thin, sparsely flecked sheath. The lightly to moderately pigmented hermaphroditic duct (HD) joins the seminal vesicle to form the fertilization sac (FS) from which diverge the oviduct (OD) and the sperm duct (SD); the latter leads into the prostate gland. The oval prostate (PG) enclosed by a thin, transparent, unpigmented to sparsely flecked sheath, is composed of acini slightly coarser than those of the albumin gland. The vas deferens follows the penis (P) along its dorsal surface; as it approaches the distal end of the penis it enlarges to form the epiphallus (EP) which enters the unsheathed penis terminally; the penis enlarges immediately into a cylindrical form. The cylindrical penial appendage (PA), approximately the length of the penis, arises from the proximal end of the penis. Fibers of the broad retractor muscle (PRM) attach to the epiphallus, penis and penial appendage. Pilsbry (1948, p. 845) states the penial appendage “is free from the retractor muscle.” His Fig. 456A shows a few fibers attached to the penial appendage. The duct (SPD) of the globular spermatheca (SP) is short and stout, sometimes dilated as it approaches the vagina (VA); the vagina is short.

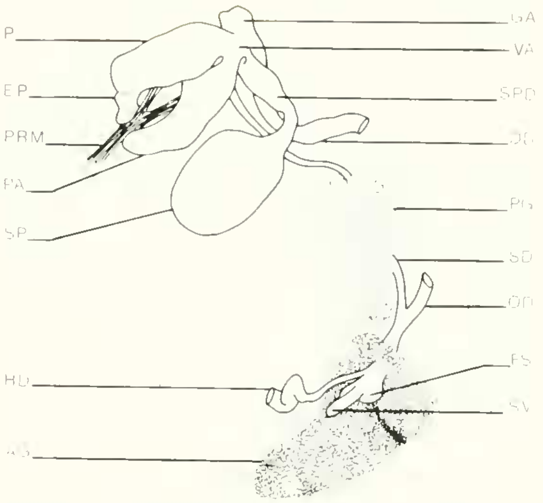

FIG. 2. *Reproductive organs of* Catinella vagans *(Pilsbry). P, penis; EP, epiphallus; PRM, penial retractor muscle; PA, penial appendage; SP, spermatheca; HD, hermaphroditic duct; AG, albumin gland; GA, genital atrium; VA, vagina; SPD, spermathecal duct; OD, oviduct; PG, prostate gland; SD, sperm duct; OD, oviduct; FS, fertilization sac; SV, seminal vesicle.*

Radula and Jaw–Radulae of three individuals of *Catinella vagans* examined have 91, 96, 97 rows of teeth, respectively. There are few tenth on the anterior-most rows; the number increases rapidly posteriorly. The number of marginals and laterals of representative rows of a radula are recorded in Table 2. Although there is an individual variation of the radulae and, also, of the rows of teeth of a radula, the ratio of marginals to laterals approximates 1:1.

The characteristics of the teeth of *C. vagans* are described as follows and illustrated in Fig. 3, A. The central tooth (C) bears a long, broad, basal plate with a posterior serrated margin flanked on either side by a rounded boss. The pointed mesocone, variable in length, extends downward as far as to the lower third of the basal plate. A short, pointed ectocone flanks the mesocone on either side. The laterals (R-L-1; R-L-10) have a pointed mesocone varying in

TABLE 2. *Formulae of representative of teeth of* Catinella vagans *(Pilsbry).*

Station	Slide	No. of Rows of Teeth	Row	M		L		C		L		M
Field No. 494 Pumping Station, City of Wildwood, Cape May County, New Jersey	A	91	25	11	-	13	-	1	-	13	-	14
			39	12	-	15	-	1	-	15	-	12
			62	13	-	15	-	1	-	15	-	12
			70	13	-	14	-	1	-	14	-	13

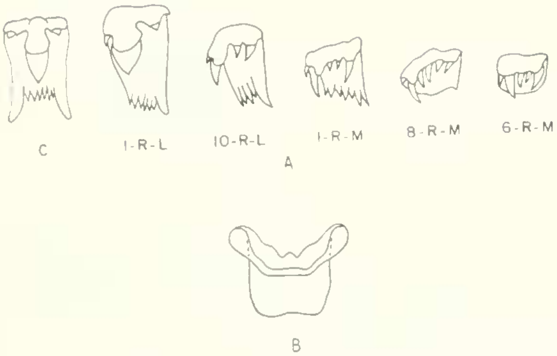

FIG. 3. A, *Representative radula teeth of* Catinella vagans *(Pilsbry). Row 76:* C, *central tooth; 1-R-L, first left lateral; 10-R-L, tenth right lateral; 1-R-M, first right marginal; 8-R-M, eighth right marginal. Row 71: 6-R-M, sixth right marginal.* B, *A jaw of* Catinella vagans *(Pilsbry).*

length from a very short structure to some extending downward to the level of the posterior margin of the basal plate. A small, pointed endocone is present. The ectocone, undivided in the more medial teeth, is divided into two cusps in the more lateral teeth. The distinction between laterals and marginals is not always clear because sometimes a tooth whose ectocone is divided into three cusps is flanked on either side by one whose ectocone is divided into two cusps. The marginals (1-R-M; 8-R-M) smaller than the laterals, have a basal plate which is broader than long, true especially of the outermost marginals. The small endocone is sharply pointed; the pointed mesocone extends to and below the margin of the basal plate. The ectocone is divided generally into three, sometimes into two or four cusps of varying lengths.

The features of the teeth of *C. vagans* compare with those of species of the genus, namely (1) the ratio of the laterals to the marginals approximates 1:1 and (2) the basal plate of the marginals is broader than long. Such features of the genus were noted by Quick to be true of *Catinella (Succinea) arenaria* ("B.-Ch.") (Quick, 1933, Fig. 4, p. 296) and by Franzen of *Catinella parallela* Franzen (Franzen, 1979, p. 66, Table 2; p. 67, Fig. 3A).

The amber-colored jaw is illustrated in Fig. 3B. Anteriorly the collar has a median fold flanked on either side by a larger fold. Posteriorly the margin of the collar has a fold on either side of the median indentation.

Catinella waccamawensis n. sp.

Quickella vagans (Pilsbry) 1948. Vol. II, Pt. 2, pp. 844–845, Fig. 456C.

Description of Holotype–Shell: Fig. 4, A, B. Shell light amber-colored, glossy, translucent, thin, very fragile, imperforate, elongate-ovate, composed of three tumid whorls; suture sharply incised; height 7.1 mm, width 4.6 mm, height of aperture 4.9 mm, width of aperture 3.3 mm. Height of ovate aperture equals 69% of total height of shell (Table 3). Sharply edged peristome very fragile; light amber columella follows inner border of peristome, curves as it ascends into the ultimate whorl. Nuclear whorl knoblike; spire short; whorls increase rapidly in size resulting in an elongate, tumid ultimate whorl. Nuclear whorl finely granular; longitudinal striations fine on penultimate whorl, increasing gradually towards the aperture. Surface coated with fine grains of sand and soil.

Holotype–Catalogue No. FMNH 200983; Paratype No. FMNH 200984 Molluscan Collection, Field Museum of Natural History, Chicago, Illinois. Additional paratypes in the private collection of the author.

Description of paratypes–Shell: (Fig. 4, C, D). Shells of mature snails, attaining a height of 7.5

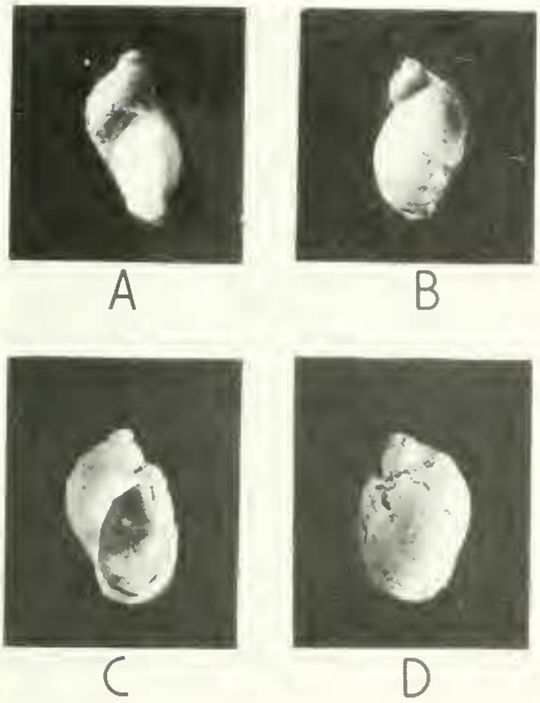

FIG. 4. **A, B,** *Holotype of* Catinella waccamawensis *n. sp. (Height 7.1 mm).* **C, D,** *Paratype of* Catinella waccamawensis *n. sp. (Height 6.5 mm). Type locality, Lake Waccamaw, Columbus County, North Carolina.*

mm, are comprised of 2–1/2 to 3 inflated whorls. Dimensions of the holotype and six paratypes, the median of the series, are recorded in Table 3. The height of the largest shell is 7.5 mm, its width is 5.9 mm. The aperture occupies from 65.5 to 75.0 percent of entire height of shell. Other ratios are to be noted in Table 3. The shells are extremely fragile, break readily, making accurate measurements difficult.

Head, Body and Mantle Surfaces – Surface of head and body wall cream-colored, lightly pigmented, finely, irregularly tuberculate. Pigmentation of dorsal surface of head consists of bands of fine flecks anteriorly forming a triangle, narrowing between the superior (posterior) tentacles into a single band; pigmentation posterior to tentacles diffused over the dorsal body surface; the triangle flanked on either side by a band. Surface of both pairs of tentacles flecked. Retractor muscles of superior tentacles black. Lateral body wall lightly pigmented with fine flecks forming an indistinct band.

Genital aperture, situated on anterior right-hand side of body, lunate, about 0.5 mm in length, surrounded by a white lip. On either side a pedal groove, continuous from labial palyp to posterior lip, separates foot from lateral body wall; pedal groove paralleled by less pronounced suprapedal groove. Shallow, vertical grooves incise pedal and suprapedal grooves, the lateral body wall and the pigmented band, produce shallow scallops along margin of the foot especially when animal is in a somewhat contracted state. Sole of foot is light cream-colored and unpigmented.

Mantle collar is lightly flecked overall. On the mantle a narrow, finely-flecked band parallels the mantle collar from which bands extend to anterior margin of the nephridium. Nephridium white, partially outlined by a narrow, dark band and covered by flecks of pigment. The liver is light golden brown in color. Pigmentation of other paratypes is variable in intensity and distinctness in pattern.

TABLE 3. *Dimensions of shells of* Catinella waccamawensis *n. sp. The measurements are of the seven measureable shells obtained from the type locality. In the 4th column of measurements are listed the ratios of the width of the shell over its height. In the last 3 columns are listed the ratios of height of aperture over height of shell, width of aperture over width of shell, width of aperture over height of aperture.*

	No. of Whorls	Height	Width	Width/ Height	Height of Aperture	Width of Aperture	H. Ap./ H. Shell	W. Ap./ W. Shell	W. Ap./ H. Ap.
Holotype:	3	7.1 mm	4.6 mm	.647	4.9 mm	3.3 mm	.69	.717	.673
Paratypes:	3	7.5	5.9	.786	5.2	3.7	.69	.627	.711
	3	7.3	5.0	.684	5.5	3.8	.75	.76	.69
Type Locality	2 3/4	7.0	4.6	.657	4.8	3.4	.685	.739	.708
Field #483	2 1/2	6.1	3.8	.62	4.0	2.5	.655	.657	.625
Lake Waccamaw	2 3/4	6.0	3.5	.58	4.3	2.7	.71	.77	.627
Columbus County	2 1/2	5.9	3.5	.59	4.1	2.8	.69	.80	.625
North Carolina									
Range (7 shells)	2 1/2-3	5.9-7.5	3.5-5.9	.58-.68	4.0-5.5	2.5-3.8	.655-.75	.627-.80	.625-.71
Median		7.0	4.6	.647	4.8	3.3	.69	.739	.673

Reproductive System–(Fig. 5) The albumin gland (AG) triangular in form, composed of fine acini, enclosed within a thin, transparent, unpigmented sheath; seminal vesicle (SV) enclosed within a thin, transparent, lightly flecked sheath, elongate, bilobed, one lobe small and closely adherent to the larger lobe. The lightly pigmented hermaphroditic duct (HD) and the seminal vesicle join to form the fertilization sac (FS) from which a duct divides into the oviduct (OD) and the sperm duct (SD) which leads into the prostate gland (PG). The oval prostate gland, enclosed by a thin, transparent unpigmented sheath, is composed of fine acini slightly larger than those of the albumin gland (AG). Length of albumin gland exceeds that of the prostate gland. As the vas deferens approaches the penis it follows the penis along its dorsal surface, enlarges to form the epiphallus (EP) to enter the distal end of the unsheathed penis which enlarges immediately into a cylindrical form (P). The penial appendage (PA) whose base is almost half the length of the penis, originates subterminally near where the penis joins the genital atrium (GA); appendage expands into a large pouch-like structure; anterior-posterior dimension of the appendage is almost thrice the diameter of the penis. Fibers of the broad, stout penial retractor muscle (PRM) insert mainly onto the base of the penial appendage; lesser fibers insert onto the penis and onto the epiphallus. The globular spermatheca (SP) is connected to the vagina (VA) by a stout, short spermathecal duct (SPD). The short vagina (VA) expands as it opens into the genital atrium (GA).

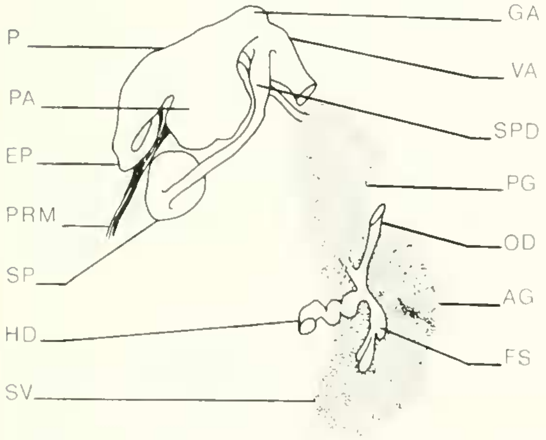

FIG. 5. *Reproductive organs of* Catinella waccamawensis *n. sp. P, penis; PA, penial appendage; EP, epiphallus; PRM, penial retractor muscle; SP, spermatheca; HD, hermaphroditic duct; SV, seminal vesicle; GA, genital atrium; VA, vagina; SPD, spermathecal duct; PG, prostate gland; OD, oviduct; AG, albumin gland; FS, fertilization sac.*

Radula and Jaw–Radulae of two paratypes of *Catinella waccamawensis* n. sp. were stained and mounted; the number of rows of teeth, 72 and 73. There are few teeth on the anteriormost rows; the number increases rapidly posteriorly. The number of marginals and laterals are recorded in Table 4. Although there is an individual variation of the radulae and, also, of the rows of teeth of a radula, the ratio of marginals to laterals approximates 1:1. The characteristics of the teeth are described below and illustrated in Fig. 6A.

TABLE 4. *Formulae of representative rows of teeth of* Catinella waccamawensis *n. sp.*

Station	Slide	No. of Rows of Teeth	Row	M	L	C	L	M
Type Locality: Lake Waccamaw, Columbus County North Carolina	A	73	15	9	9	1	9	8
			29	10	8	1	8	10
			41	10	8	1	9	8
	B	72	31	10	8	1	8	10
			42	10	9	1	9	10
			44	11	8	1	9	10

The central tooth (C) bears a long, broad, basal plate with a posterior serrated margin flanked on either side by a prominent, rounded boss. The pointed mesocone extends downward

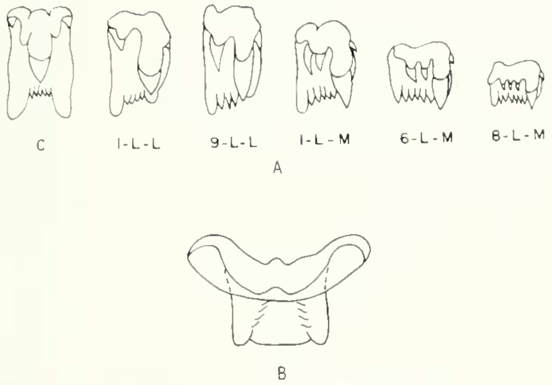

FIG. 6. **A,** *Representative radula teeth of* Catinella waccamawensis *n. sp. Row 45: C, central tooth; 1-L-L, 1st left lateral; 9-L-L, 9th left lateral; 1-L-M, 1st left marginal; 6-L-M, 6th left marginal; 8-L-M, 8th left marginal.* **B,** *A jaw of* Catinella waccamawensis *n. sp.*

to about the lower fourth of the basal plate. A short, pointed ectocone flanks the mesocone on either side. The laterals have a large, long, pointed mesocone flanked medially by a short endocone, laterally by a single ectocone: 1-L-L, 9-L-L. The basal plate of the outermost laterals is shorter than of the more medial laterals. The marginals, smaller than the laterals, have a basal plate broader than long; this is especially true of the outermost marginals. The small endocone is pointed; the larger, pointed mesocone extends beyond the basal plate. The ectocone of the innermost marginals is divided into two, of the outermost into three cusps; 6-L-M, 8-L-M. Features of the teeth of *C. waccamawensis* n. sp. compare with those of species of the genus, namely, the ratio of the laterals to marginals approximates 1:1 and the basal plate of the marginals is broader than long. This is true, also, of *C. vagans* (Pilsbry) as noted above.

The amber-colored jaw is illustrated in Fig. 6B. Anteriorly the collar has a median, bluntly pointed fold flanked on either side by a lower, rounded fold. The posterior margin of the collar is indented medially.

Type Locality - Habitat—Lake Waccamaw, Columbus County, North Carolina, North shore

Comparison of Catinella waccamawensis n. sp. with Catinella vagans (Pilsbry)

Structure	C. waccamawensis n. sp.	C. vagans (Pilsbry)
Shell.		
No. of whorls	2½ - 3	2½ - 3
Height, range	5.9 mm - 7.5 mm	7.6 mm - 10.8 mm
Width, range	3.5 mm - 5.9 mm	5.0 mm - 6.4 mm
H. of shell/W. of shell (Median	.69	.76
Nuclear whorl	knoblike	appressed
Pigmentation of body:		
General	lighter than C. vagans	moderately
Head	pattern not as distinct	distinct bands
Dorsal body wall	diffuse	in form of bands
Lateral body wall	lightly pigmented, indistinct bands	broad band
Mantle	anterior band, narrow	anterior band, variable
	nephridium partially outlined by a narrow band	anterior margin of nephridium outlined by a dark band
Nephridium	white	light cream
Liver	golden	golden brown
Reproductive system		
Penial appendage	pouch-like, anterior-posterior dimension about 3X diamter of penis	cylindrical, approximately length of penis

of Lake Waccamaw at intersection of Lake Shore Drive and McRae Lane (3.7 mi. from junction of U.S. Highway 74 and 76, east end, with Route 214). Date of collection, July 15, 1978. The shore is flat for about twenty feet from shore line to the abruptly rising bank; area shaded by pine *(Pinus)*, willow *(Salix)*, birch *(Betula)* and cypress *(Taxodium)* trees. *Catinella waccamawensis* n. sp. was found living on wet, sandy ground, moist boards and dead leaves along the shore of the lake.

Distinctive Features – Shell: Comprised of 2–1/2 to 3 inflated, sharply incised whorls; maximum height of shells of this series, 7.5 mm, width, 5.9 mm. The median of the height of aperture over height of shell, .69 (69%). Nuclear whorl knoblike, surface finely granular.

Pigmentation – Pigmentation of animal is generally very light. The bands of pigment on the head form a characteristic triangle, a single band courses between the superior tentacles; pigmentation on dorsal body wall is diffuse, not in distinct bands. Pigmentation of lateral body wall is not in form of distinct bands. Pigmentation of edge of mantle varies from a narrow band to absence of a recognizable band. Nephridium is white, not distinctly outlined with a black band. Liver is a golden color.

Reproductive System – Penial appendage is a large pouch-like structure whose base is almost half the length of the penis. Penis is cylindrical in form. Seminal vesicle is bilobed, one lobe small and closely adherent to the larger lobe.

Comparison of the features of *Catinella waccamawensis* n. sp. with those of *Catinella vagans* (Pilsbry) are shown in the outline on previous page.

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THE MORPHOLOGY AND DISTRIBUTION OF *OCENEBRA GRIPPI* (MURICIDAE: OCENEBRINAE)

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ABSTRACT

Ocenebra grippi *(Dall, 1911) ranges from Monterey, California, to Punta Banda, Baja California Norte, Mexico. The radula is illustrated for the first time, and features of the shell morphology and ontogeny are clarified.*

Recent collections by scuba diving have yielded specimens that give information about the radular and shell morphology and range of an obscure muricid species.

References and Synonymy – *Eupleura grippi* Dall, 1911: 87. Dall, 1921: 100; pl. 5, fig. 1.